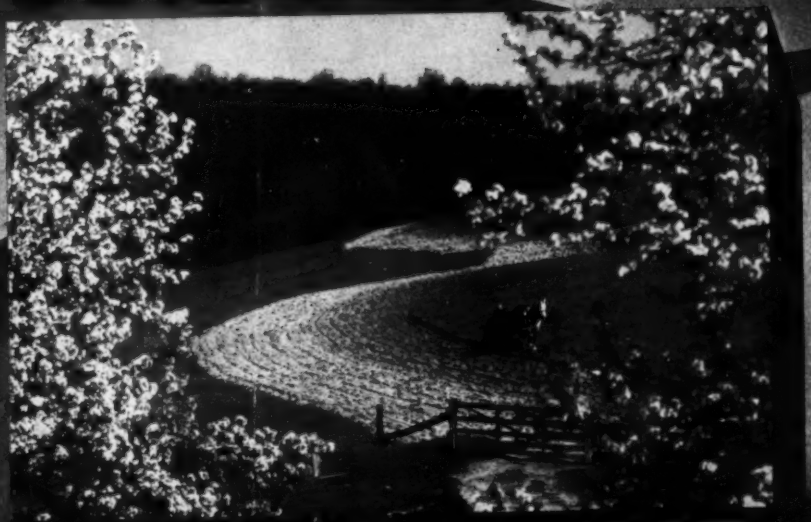
SOIL CONSERVATION



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SOIL CONSERVATION

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This field on a sloping hillside has been revegetated and will be permanently retired to grass. A good stand of crested wheatgrass is beginning to show.

Henri Folmer.

DUTCH IMMIGRANT FARMS FOR FREEDOM IN A NEW LAND

By V. P. McCONNELL[1]

FORTY-TWO YEARS ago Henri Folmer was born in Holland in the heart of a prosperous agricultural region. As a boy of 13, he felt the electric shock that vibrated throughout Europe. War had started—and war spread. He saw the red sky of burning Antwerp and for 4 years heard the continuous booming of cannon on the nearby front.

Finally, a war-weary Europe found peace again. With his countrymen in neutral Holland, Henri Folmer celebrated the signing of the Armistice. Inspired by Woodrow Wilson and American idealism, he dreamed of a new and better world that would rise, phoenixlike, from the ashes of the old.

For years, a Europe of promises and hope. A League of Nations struggling but impotent. Again the threat of war returned, this time under the leadership of two power-seeking men—one in Berlin and one in Rome. Henri Folmer held little hope for peace, and he dreaded the prospect of another European conflagration. In 1936, he sold his belongings and migrated to America.

At first, the Folmer family lived in New York City. Then, following the old tides of migration, they moved westward to Chicago. For 4 years, Henri Folmer prospered in his adopted land—prospered until his health broke and doctors told him that he must go even farther west to a high, dry climate.

[1] Work unit leader, Southwestern Region, Soil Conservation Service, Estancia, N. Mex.

After the doctors had given their decision, the first thing Henri Folmer thought of was farming. After all, he was a farmer at heart. He had been reared among peaceful farm folk. Two of his uncles in Holland had even gained some renown for introducing the first tractor into the country.

There was, to be sure, plenty of rich farm land in Illinois, Wisconsin, and Indiana, but low altitudes were out of the question. The fear of buying the wrong place weighed heavily on his mind, and he wrote to the United States Department of Agriculture for advice. A fruitful correspondence ensued with W. D. Blackley of the Division of Farm Management. The Chicago cliff dweller, armed with something more realistic than the vague advice to "go West," traded his car for a truck and started his expedition toward the setting sun in December 1940.

In 3 months, the Folmers traveled more than 14,000 miles. Day after day, they looked at farms and ranches. They traveled over the frozen stretches of Wyoming and Montana. They drove hundreds of miles over country roads in Colorado and Wyoming. They sped across the desert and priced land in Califorina and Arizona. By the process of elimination, they finally thought that New Mexico might give the right answer to their problems.

New Mexico had a sunny climate and ample land at a price the immigrants could afford. After 6 months of searching, Henri Folmer found two dryland farms which lie along U. S. Highway 66, about 30 miles east of Albuquerque, in the wooded hills overlooking the Estancia Valley. In this particular area, the average annual rainfall is 16 inches—enough to raise pinto beans and livestock successfully. The mile-high altitude was just what the doctor had ordered!

Mr. Folmer knew that his real work had only begun with the purchase of the land. He saw that the short, sparse grass was much different from the luxuriant grasses of his native land, where 12 acres were sufficient to graze 12 cows. He noticed the steep slopes, the gullies in the cultivated fields, the sagging fences, the inadequate water supply, the run-down buildings. Most important, he realized that valuable topsoil was washing away each year. Mr. Folmer went to the Soil Conservation Service for help.

Soil Conservation Service technicians made a survey and presented their plan for land improvement. Mr. Folmer heartily approved the plan and soon CCC men, stationed in a camp at nearby Edgewood, started to work. They built and repaired more than 2 miles of fence, plugged dozens of gullies, and constructed a stockwater dam.

Going over details of cooperative agreement; Henri Folmer, at left, V. P. McConnell, SCS man, at right.

When the CCC camp was closed, Mr. Folmer went ahead enthusiastically with the work. He has completed his boundary fence, cleaned out old wells and equipped them with storage tanks, terraced four cultivated fields, reseeded some land unfit for farming, and planned a scientific crop rotation. Corrals have been built and barns repaired. One new well, 545 feet deep, has been dug.

Mr. Folmer wants to put down roots into the New Mexico hills and he has projected many plans into the future—jobs that will be done as soon as time and labor permit. With the help of the Range Development Service of the General Land Office, he is enclosing the public domain lands that make up part of his pastures. Cross fences in pasture land will enable him to use a system of rotation and deferred grazing. Another well will be dug. And then there's his home, already nearing completion.

It will be truly a home, not merely a house, for Mr. Folmer hopes to spend the rest of his days in the sunny Southwest. When he considered a building site, he noticed that most of his neighbors built their homes near roads. At first, he thought he should do the same, but an innate desire for quiet and seclusion eventually led him to select a site behind a small wooded hill.

From his doorstep stretches a magnificent panorama—the wooded Sandia Mountains on one side, the treeless expanse of the Estancia Valley range lands on another, and the snow-crested Sangre de Cristo Range far in the distance. Wisely, he is using native materials for his home—rocks for the foundation and huge tree trunks (*vigas*) to support the roof. He is his own contractor, his own architect, and he has hired neighbors to help with the actual construction.

Mr. Folmer recalls the rich farm land and the well-kept farmsteads and barns of his native Holland. Except for disruptions of war, which the peace-loving Dutch avoided pretty well until Hitler's armies swarmed in, most Dutch farmers have led a stable kind of existence, with generation after generation zealously guarding the fertility of the land. So, to Mr. Folmer, this New Mexico home must be a permanent and pleasant haven. To make life more pleasant, the Folmers will have a flower garden, vegetable garden, vineyard, and orchard.

Mr. Folmer terraced four of his cultivated fields. The story behind the building of these terraces deserves telling. Before Mr. Folmer purchased the land, the former owner, in cooperation with the Soil Conservation Service, had terraced one field. Looking at the field, Mr. Folmer recalled the stone bench terraces that he had seen in the hills of Switzerland. "Why not terraces here too?" he mused. "We'll see what effect they have on crop production."

The first year of farming convinced him that terraces pay in sloping hill country. On the terraced field, he harvested 500 pounds of pinto beans per acre. On a nearby unterraced field, he gleaned only 150 pounds per acre. To Mr. Folmer, that was convincing evidence, particularly when he noticed that erosion had stopped on the terraced field.

Since the newly formed Edgewood Soil Conservation District, which includes the Folmer farm, did not have machinery available for terrace building, Mr. Folmer bought a small terracing machine. On four fields, he has built terraces and division ditches and developed grassed drainageways wherever they are needed. Water is precious in the semiarid bean country, and terraces help to hold every vital drop.

Several small strips of land, broken out in draws and badly eroded, have been returned to permanent grass. Mr. Folmer bought some of the grass seed and the Edgewood District is furnishing the remainder. Altogether, about 50 acres of badly eroded land have been revegetated.

Naturally, Mr. Folmer is planning his farm so that he will earn sufficient income for his family; but more important just now is his desire to help America—truly a land of freedom and security for him—in the eventual overthrow of dictatorial rule in the world. Because of poor health, he is disqualified for military service. But food—that's important too. So beans and meat and milk will be Henri Folmer's contribution to the shaping of a free world.

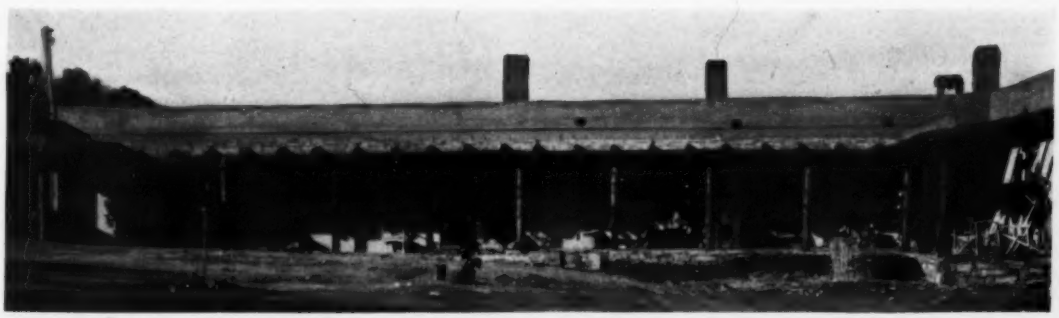
Of the 545 acres of cultivated land on his farm, about 400 acres will be planted in pinto beans this year. As everyone knows, beans are a war crop—a food high in protein, easily shipped, safely stored. The Nation needs more beans, and by the end of 1943, Henri Folmer should harvest something like 200,000 pounds of strength-giving pintos. Beans will be grown in a rotation with feed crops of small grains, corn, and sorghum.

As rapidly as possible, Mr. Folmer is building a small herd of Jersey cows. With three cows already on the farm, he intends to be milking at least a dozen Jerseys before the end of the year. A few head of purebred Hereford cattle form the nucleus of his breeding herd for beef cattle, a herd that will be gradually increased to the carrying capacity of the range. Mr. Folmer is so proud of his livestock that he plans to build a corral near the highway as a sort of showplace for people who pass by.

Besides crops and livestock, Mr. Folmer also will get some income from piñon and juniper trees on his range land. Naturally, he doesn't intend to chop down all of the trees. Instead, he will thin out dead and mature trees each year according to the recommendation of Soil Conservation Service foresters and will use this wood as fuel for home use and for sale.

Some people may believe that Mr. Folmer's ambitions encompass too much for an ordinary lifetime. Mr. Folmer would disagree with them. He is farming for tomorrow as well as for today. He is rap-

(*Continued on p. 235*)



The permanent home being built by Mr. Folmer in the piñon-covered hills of New Mexico.

Alva Marie Shepherd, daughter of Mr. and Mrs. Alvin M. Shepherd, of Nelson County, enjoys working in the family Victory garden, as well as doing other farm work.

CONSERVATION FARMING AND LABOR

BY R. J. FISHER[1]

DOES CONSERVATION farming require more labor? Variations in types of soil, lay of land, kind of equipment used and the ability of the operator to manage—each has a distinct bearing on labor required, cost of production and whether or not the farm will be prosperous.

If one is thinking of labor required to handle certain jobs on an average farm under a conservation plan, the answer to the question is *yes* because of the following:

1. On the average farm where strip cropping and/or terracing are followed, the strips are of irregular width, requiring additional time to prepare land, cultivate and harvest crops.

2. Terraces require maintenance and are sometimes objectionable from the standpoint of using heavy machinery.

[1] Chairman, District Supervisors, Thomas Jefferson Soil Conservation District, Gordonsville, Va.

Soil conservation includes sound pasture management. Shown here is a portion of the large, well managed pastures on the farm of Dr. J. W. R. Smith.

3. In some instances when a farm is rearranged more fencing is required.

4. Following the setting up of a conservation plan, per-acre yields increase and more labor is required for harvesting.

On the other hand, if one is thinking of labor required per unit of production, the answer is *no* because of the following:

1. The farm is planned so that each piece of land will be devoted to the production of the crop to which it is best suited. For instance, the more level land is put in row crops and the steeper, rougher land in pasture, permanent hay or woodland. The shifting of crops from the steeper to the more level land generally will result in a saving of labor.

2. It usually follows that the rearrangement of a

White oak timber sawed from the Edgar L. Bradley farm near Carter's Bridge, Albemarle County, will be used for shipbuilding. Most of the trees from which this timber was sawed were more than 70 years of age.

One of the many better land use patterns seen on farm of Dr. J. W. R. Smith, who is owner of the Chadwell Estate in Albermarle County, birthplace of Thomas Jefferson.

Like many other farmers in the Thomas Jefferson soil conservation district, Paul Black, of Albermarle County, is clearing fertile bottom land for pasture. This practice relieves pressure on upland for a more diversified system of row crop farming.

farm results in a reduction in acreage of cultivated land, although the total yield generally is increased. For example, on one dairy farm in the Thomas Jefferson Soil Conservation District, 50 acres of corn yielded 90 tons of silage in 1936. Five years later, following strip cropping and other conservation practices, the farmer reduced his corn acreage to 40 acres, and made 400 tons of silage besides shucking out 100 barrels of corn. This same farm usually bought hay to carry the cattle through the winter. At the end of a 5-year period, after wintering 80 head of cattle, an increase of 74 percent, he had 10 tons of hay left over. (As you remember, 1941 was somewhat of a dry year). While this increased production was being obtained the total number of laborers that were required on this farm was reduced.

A sample survey was conducted by Lyman Carrier within the 14 soil conservation districts in Virginia, including 120 farms that were following a conservation plan. This survey showed a decrease of 16 percent in corn acreage, with the gross yield increased from 12,500 bushels to 19,200 bushels, or a total increase of 36 percent.

3. The expense and labor required in changing to and maintaining conservation farming will be more than offset by labor saved on gully and gall repair, as well as a saving of labor required to clean out lowland drainage ditches that have become filled with

This pasture on the farm of Donald B. Kane, near Charlottesville, in the Thomas Jefferson soil conservation district, has been contour furrowed, fertilized, limed, and seeded two years.

A heavy application of barnyard manure in August, following a crop of corn, is very helpful where grain will follow in the fall. This practice, as shown on the K. B. Wyeth place in Albermarle County, is common throughout the district.

Vineyards on contour to safeguard fertile hill land against erosion; tended by the Catholic Institute at Lewis Mountain, which cooperates with the Thomas Jefferson soil conservation district.

Dr. J. W. R. Smith spends most of his time working with tenants on the farm. Here he is seen spreading lime on land which has been prepared for small grain. He is a cooperator in the Thomas Jefferson soil conservation district.

soils from those gullies on the upland, to say nothing of the saving of the farmer's most valuable asset, topsoil. In the Valley of Virginia, on Route 11, one 12-acre field was planted to corn with the rows running up and down the slope. In June 1941, one sudden shower deposited soil from this field on the highway 18 inches deep. The Highway Department sent up 5 trucks to move this debris from the road. The farmer furnished labor to load this soil on the trucks; 91 tons of it was hauled back on the field. This, all in Virginia.

4. From all the information that I have been able to secure the amount of returns per man-hour spent on the farm is greater on those farms practicing conservation farming than on those that are not. As Dr. T. B. Hutcheson says, "All that a farmer has to sell is plant food and labor." If he loses nine-tenths of his plant food before it gets into crops his labor cannot be used very efficiently. So, the more plant food used by crops, everything else equal, the more returns he gets per hour for his labor.

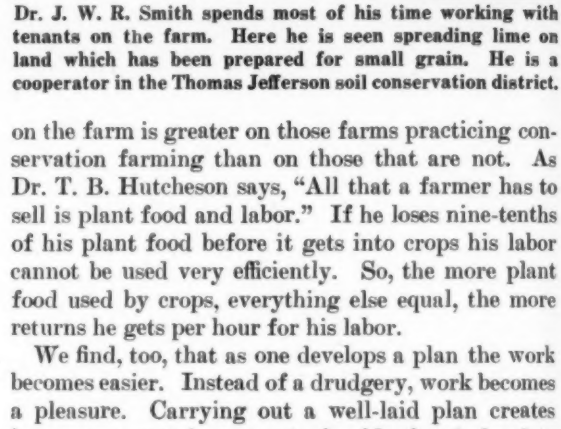
We find, too, that as one develops a plan the work becomes easier. Instead of a drudgery, work becomes a pleasure. Carrying out a well-laid plan creates in a man a certain amount of pride that is hard to obtain by doing work in a haphazard way.

NOW THE FARMERS TELL *US*

BY L. R. COMBS[1]

FOR TEN years men of the Soil Conservation Service have been telling farmers that contour tillage will check erosion, increase yields and reduce production costs. Now with war production in full swing the echo comes back from the country, amplified a thousandfold, to indicate that soil conservationists have not been "shouting down a bottomless well."

Today farmers are telling the Service that contour tillage is a good thing. They tell it in no uncertain terms. Their statements are backed by higher yields and income, more livestock feed, diminished erosion, less machinery wear and breakage due to crossing gullies, easier pulling for the horses, lower fuel costs because tractors run in high gear instead of low.



Contour plowing on the R. and C. Mulliner farm, Northfield, Minn. Note the grassed waterway left to carry away surplus water which concentrates in the natural drainageways.

[1] Chief, Regional Division of Information, Upper Mississippi Region, Soil Conservation Service, Milwaukee, Wis.

Faced with the necessity of producing more food, oil and fiber crops, and in many instances already farming all the tillable land, farmers are finding that contour tillage is necessary to their wartime production plans. In the dairy, pork, and beef areas, higher crop yields and better feeding mean more meat and milk and butter.

Since farmers themselves are giving the Service the ammunition we can and are using to best advantage today, I will let them tell their own story:

O. L. Gustafson, operator of a 420-acre farm in Marshall County, Ill., drilled 90 acres of corn on the contour last spring, using furrow openers. The corn was rotary-hoed three times and cultivated once. The average yield was 80 bushels an acre.

"No wire was used when planting, so I saved time on that operation," Gustafson said. "The furrow openers put the corn in 3- or 4-inch furrows, and using a rotary hoe gave me as clean corn as I've ever had. I had 60 acres of checked corn this year which averaged 60 bushels. I know that drilling on the contour gave me 10 bushels more per acre. The other 10-bushel increase was the result of more rainfall, sweetclover, and manure. I have seen water standing in the contour corn rows after a rain. Water held like that produces corn instead of gullies."

He also drilled 70 acres of soybeans, using the same planter and furrow openers that he had used for corn.

Gustafson said he not only saved soil and moisture and increased yields to meet war demands, but increased his pork and lamb production about 50 percent.

Over in Iowa is Robert Hiatt, another farmer who no longer thinks that a straight furrow is necessarily the trademark of the best farmer. On his Jefferson County farm he obtained a 4- to 5-bushel increase in soybean yields per acre by contouring.

"It required less time to cultivate these beans," said Mr. Hiatt, "because I could keep my tractor in high. I save 3 or 4 gallons of fuel per acre because I was on the level all the time."

This year he plans to plant all of his corn and soybeans on the contour.

In Indiana's Grant County soil conservation district, George Heinlein planted soybeans on the contour in one field and in straight rows on an adjoining field of similar slope, soil type and productivity. The contoured beans yielded 22 bushels an acre, or 4 more than the old-fashioned up-and-down-hill field. Mr. Heinlein stated that the only difference between the two fields was the contouring.

Chris Mueller, Sauk County, Wis., found that he saved 17 percent in tractor power by farming on the contour. Harry Powell of the same county says, "I saved 2 hours' time by contour cultivating an 8-acre field."

Glen Stuckert, son of Henry Stuckert, cultivates corn on the contour on his father's farm near Oconomowoc, Wis.

These individual farmers' experiences are merely examples of hundreds of similar cases in the Upper Mississippi Region, that might be cited as evidence that a straight line is no longer the shortest route to the highest yields. As further convincing evidence let us look at the results of a survey made in the Crawford County, Iowa, soil conservation district:

Inquiries were sent to farmers who had been following the crooked row on at least part of their cultivated fields. Most of them did not have strip cropping or terraces. Of 179 farmers answering, 178 reported that contouring saved soil; 161 reported it saved moisture; 171 reported that it increased their corn yields, and 80 reported increased grain yields. The average per-acre increase in corn yield reported was 11 bushels, and in small grain, 10 bushels.

One hundred and one farmers reported that weed control is no more difficult in contoured corn than in check-rowed corn. Asked if they intended to continue contour tillage this year, 157 answered "yes" and 123 promised that their entire farms would be on the level.

The Winneshiek County, Iowa, soil conservation district made a similar survey, sending inquiries to 235 farmers and receiving 153 replies—a return which

would warm the heart of any commercial advertiser and in itself an indication that farmers are really interested in the "crooked, crazy-quilt" type of farming that many of them scorned a few years ago.

The Winneshiek County survey, however, includes all contouring—that in strip cropped and terraced fields as well as plain contouring. Ninety-eight farmers reported increased corn yields—the increase averaging 10.5 bushels an acre—while 45 were undecided or didn't know. Ten reported "no increase." One hundred and three reported noticeable savings in fuel and power, the average fuel saving being 12 percent.

So the reports run on farm after farm through the Corn Belt; and research results indicate that the conclusions of practical farmers are accurate.

Studies in Illinois under the direction of Elmer L. Sauer, project supervisor, Division of Economic Research for 3 years, 1939 to 1941, give contour tillage an advantage of 7.7 bushels of corn per acre, 3.3 bushels of soybeans, and 10.2 bushels of oats. These averages are based on yields taken from farm records of operators who grew the same crop both on the contour and in straight rows on the same farm.

In a study of operating costs, Mr. Sauer matched 135 contour farms with 135 comparable neighboring straight-row farms. Horse and machinery costs and labor costs per crop-acre were practically the same, the few cents difference being in favor of the contour farmers. Tests on some of the soil conservation experiment stations give similar results.

To see a farmer laying out his own lines and establishing contour tillage no longer is uncommon, and many more will do so this year after attending training schools or demonstrations on contour layout conducted by Service men, county agents, AAA committeemen, vocational agriculture teachers and others.

Farmers are using inexpensive hand levels and homemade devices for laying out contour lines. Several different types involving use of a carpenter's level have been made. Another, developed in Wisconsin this winter, uses the principle of a weight which holds the sights level when the instrument is in use. This homemade level, developed by a Soil Conservation Service technician, is explained in a new leaflet, "'Round the Hill Farming," published by the Wisconsin State Soil Conservation Committee in cooperation with the Extension Service. In Indiana the adaptation and use of the carpenter's level has been demonstrated to AAA committeemen in 60 county training schools. Committeemen cooperating with Service men and county agents are holding similar demonstrations for groups of farmers.

Gerald Crone, AAA committeeman in Rock Grove Township, Stephenson County, Ill., staked out his own contour lines last year using a homemade carpenter's level. He learned the method at a demonstration conducted by a Service man on a neighbor's farm. He reports that contour planting took less time and his yields were increased. One of his neighbors, Art Laible, also contoured his corn and obtained a yield of 130 bushels an acre.

Contour tillage is one of the practices selected for emphasis by many county war boards as methods of increasing production and conserving soil in 1943. A majority of soil conservation districts throughout the region that are cooperating with the Soil Con-

A contour-plowed strip in Kansas, where farmers are using conservation methods in their fight for top production.

servation Service, the AAA, the Extension Service and other agencies in the conservation-production practice program, are stressing contouring. Several have prepared simple mimeographed leaflets quoting farmers on their experience with contour tillage and other practices. One, published by the Sauk County (Wisconsin) district and entitled "A Contoured Field Will Better Your Yield," includes 1-sentence or short-paragraph testimonials from 29 farmers about increased yields, saving of power, time and machinery, and conservation of soil, fertility and water from contouring and strip cropping.

Farmers and representatives of the agencies working on the production-conservation practices program recognize that grassed waterways go hand in hand with contouring. Likewise, strip cropping and terracing go along with contouring on many slopes and soils. But farmers and soil conservationists in the field see the basic practices of contouring and grassed waterways as a starting point and are using them as such. This is assuming that adequate rotations and soil treatments have been applied. Other practices and the complete plan will come later—many farmers who have just started their conservation program via the plain contour route will tell you this.

INDIGENE TERRACES IN VENEZUELA

BY JOSE ANTONIO RUGELES[1]

THE WORLD offers simple, but very important, reasons to prove that soil conservation is a universal and collective necessity. If man, as a product of nature, struggles to take care of himself and to study the best means of subsistence, it is logical—more than logical, it is essential—that he must also take care of such resources as water, vegetation, and soil, without which he could not live. Man without land and water would not be man.

Did our aboriginal ancestors perhaps understand this better than we do?

We asked ourselves this question recently, as we looked at the ruins of terraces constructed by Indians of the Venezuelan mountain country. For, actually, along the slopes of the region called Mucuchies, in the Cordillera of the Andes in Venezuela, inhabitants of a thousand or more years ago were working to conserve the soil in which they grew their wheat and potatoes. These lands are cut sharply steep. Generally speaking, the valleys have a minimum grade of 8 percent, while in the hills the grade rises from 20 to 90 percent—and even, sometimes, higher. For the last 300-odd years these lands have been cultivated without any methods of conservation. Millions of tons of soil are lost annually, washed away by rivers and rains, and the penalty of men who work exhausted terrains is slowly being meted out. Today many of the Andes' majestic hills are split with fissures and crevices, like the wounds of a being mistreated by man.

Nevertheless our Indians of Mucuchies, as civilized in this respect as the progressive Incas of Peru, used to have terraces. In San Roman hill, which lies in our wheat country at 3,200 meters above sea level, there still remain more than 12 almost complete terraces, overgrown with weeds and deteriorating from years of abandonment. As is well known, the construction of terraces for erosion control is fairly difficult; to make it work, it is necessary to calculate the resistance of the soil to the washing away caused by rains, which depends chiefly upon the slope of the land. The Indians of Mucuchies took all this into account, as we saw when we visited the terraces with Dr. D. S. Hubbell, head of the Soil Conservation Commission, who worked in Venezuela during 6 months of 1942. The terraces were built of stone on a 30-percent slope, with a small projecting edge of the cultivable area. They run a little over a meter (4 feet) high, and about 60 meters long.

Today, when the world is bitterly engaged in one of its greatest battles, it is comforting to think back about our native ancestors. They, within their primitive existence, were able to leave us signs of what could be called an *intuitive understanding of nature*. We of this century of modern civilization should be preparing ourselves to leave to our future generations a better heritage than that of war. Through the efforts of united humanity we can erase the scars of battle.

As Americans, sons of the Greater America which reaches from Alaska to Magallanes, we have a great deal to do for the future of our continent. Let us do it in fraternal harmony, studying together the utilization of our immense resources, but not forgetting that these resources must have the protection which will make them last.

[1] Agriculturist of the Ministry of Agriculture of Venezuela, and Venezuelan representative on the program of the Soil Conservation Service for Latin America.

DRAINAGE FOR COASTAL PLAINS AREA

J. C. Hudson (left), landowner in Atkins drainage district, discusses new drainage program with W. W. Player, president of the drainage district.

BY BARRINGTON KING[1]

DOWN ALONG the Atlantic and Gulf Coastal Plains of the Southeastern Region lie vast areas of potentially productive but poorly drained agricultural land. W. W. Player, president of the Atkins drainage district in Lee County, S. C., describes it as "maybe land" . . . "Maybe you'll make a crop on it, and maybe you won't." But in total war there must be no "maybe's." We know down here that maximum, sustained production must be carried through to the end of this war—and for some time after.

Fortunately, a sound land use program already is beginning to take shape in this area; it is expected that it will make a material contribution not only to the war effort, but also to the welfare of the people who live on the land in spite of the fact that several problems remain to be worked out. Inadequate drainage constitutes a serious health menace and many of the people suffer from malaria. The uncertainty of crop production makes the economic position precarious, especially for the small land owners and tenants who live on the farms, hoping during a good year to make up for their losses during wet seasons.

It was with high hopes that a group of farmers gathered in the Atkins drainage district on December 2 to see the final excavation of a 3-mile drainage canal north of the town of Lynchburg, S. C., and to celebrate the event with a barbecue. Completion of the new canal represented the first major step in a broad-scale drainage and conservation program that will affect 14,500 acres of land in the drainage district and will serve as a demonstration of a community type drainage program for similar land.

Drainage programs are not new in the flat Coastal Plains areas of the South, and the history of the Atkins drainage district is like that of many other drainage projects. The district was organized about 20 years ago and the public drainage system was completed in 1929, just before the depression. No provision had been made, however, for technical assistance to farmers in developing farm drainage and at that time very few landowners were financially able to construct drainage facilities on their farms to take advantage of the public outlet system. Consequently, deterioration of the drainage system set in.

Fred Thompson, district conservationist, discusses plan for proper land use with Henry Benjamin, Negro farmer, following completion of new drainage canal.

When the Lynches River Soil Conservation District was organized in 1940, comprising 1,000,000 acres in Lee, Kershaw, and Sumter Counties, S. C., it was recognized that drainage was one of the principal problems and that land in the Atkins drainage district typified this problem. Consequently, the South Carolina State Soil Conservation Committee and the Soil Conservation Service selected the Atkins drainage enterprise for a drainage demonstration.

[1] Information Specialist, Southeastern Region, Soil Conservation Service, Spartanburg, S. C.

Pent-up water in old drainage system rushes through new canal as final excavation is completed, providing an outlet into the Lynches River.

The Service made an intensive survey and other investigations necessary for the development of a plan of operations and agreed to cooperate with the supervisors of the Lynches River district in the rehabilitation and improvement of the public drainage system. The investigations showed that drainage improvements were necessary on 75 to 80 percent of the land in the drainage enterprise, and that with adequate drainage, a well-balanced agricultural program could be introduced and maintained, public health could be improved, and land and property values increased.

In the proposed over-all drainage program, with the drainage district, soil conservation district, Soil Conservation Service, and other agencies cooperating, for the first time facilities will be provided for technical assistance to farmers in planning individual farm drainage for effective use of the public outlet system. This assistance will be furnished by the Soil Conservation Service as a part of complete farm conservation plans developed in cooperation with the soil conservation district. Under mutual agreements, equipment and facilities will also be provided for adequate maintenance of the drainage system.

Although all the land in the drainage district will benefit from the new program, the principal benefit will be for 9,651 acres of class III land. This is good agricultural land—Mr. Player says it is as good as any in South Carolina—but owing to lack of adequate drainage, crop production on this land is uncertain and complete crop failures often occur during wet years. It is estimated that the value of this land will increase $20 an acre, or a total of $193,020.

Estimated increases in value of all classes of land in the drainage district expected to result from the new program are as follows:

Land class	Acres	Increase per acre	Total increase
I	2,281	$10	$22,810
II	1,663	15	24,945
III	9,651	20	193,020
IV	778	10	7,780
Total			$248,555

A conservative estimate of the over-all benefits can be arrived at by assuming a 5-percent annual return on the increased land values resulting from the proposed improvements, or $12,427.75 annual benefits from the improvement program.

"Talk about increasing crop yields to aid in the war effort!" exclaimed Fred Thompson, district conservationist of the Soil Conservation Service. "You can increase yields 100 percent in 1 year with proper drainage on this kind of land. The soil is well adapted to growing pasture grasses, hay, corn, and other crops needed to produce milk and meat for the war program. And you don't have to convince people of the value of drainage. They are willing and anxious to get started."

Farmers in the drainage area bear out Thompson's assertion. They have been laboring under serious handicaps. For example, Joseph C. Hudson, whose 103-acre farm lies at the point where the new canal joins the old drainage system, says that owing to heavy crop losses on his 53 acres of cultivated land, he was ready to quit, until the new drainage

program was started. On land that will make a bale of cotton to the acre in a dry season, he made 4 bales on 14 acres this past year. He lost 8 acres of hay, 11 acres of corn, and 1 acre of tobacco, in addition to damage to other crops.

C. A. Vincent, farmer, cotton buyer, and fertilizer dealer at Lynchburg, has 250 acres of fairly high land. His farm is less subject to damage during wet weather than the average land in the community, but a considerable acreage he had planted to small grain for winter grazing stayed so wet for 2 months that he was unable to turn his cows on it.

S. E. McElveen, also of Lynchburg, made only 57 pounds of seed cotton on 6 acres last year and lost an adjoining 6 acres of corn.

"You couldn't walk across the field for 7 weeks," he said.

Isaac Evans, Negro farmer who owns 130 acres near Lynchburg, told us that he planted 2½ acres of peanuts in 1942 "to help the Government," but that he didn't even get his seed back. He also lost 10 acres of corn, out of 30 acres planted, 10 acres of peavine hay, 6 acres of oats, 3 acres of cotton, and 1 acre of tobacco.

"I would have been in a bad fix for hay if the grass hadn't taken my cotton," he said. "I just harvested the grass for hay, and that will have to carry my stock through the winter."

The economic plight of some of the small farmers is well illustrated on the farm of Henry Benjamin, another Negro farmer, who said that to carry his family of six through the winter last year he had only one 50-pound shoat, 12 gallons of sorghum syrup, 20 bushels of sweetpotatoes, and a little corn for cornbread.

"I never made a money crop at all last year, and didn't do much better this year," he said.

Henry was born within 2 miles of the farm where he has lived for the past 35 years. The farm was left to him by his mother, but 2 years ago, after several bad crop years, he lost the farm and has just stayed on there since that time as a tenant.

In good years, he has made from three-quarters of a bale to a bale of cotton per acre on the little 30-acre farm, but last year he made only 70 pounds of lint cotton on 6 acres. Most of his corn drowned out, but where he had bedded it high he made a few nubbins, enough to provide meal for corn bread.

Five acres of peavine hay that he planted was a total loss, and he made only 5 bushels of grain oats on 5 acres. Water stood on his land so long that three of his four hogs died, and he had to kill the last 50-pound hog for meat to carry him through the winter.

But Henry, like other farmers in the drainage area, is expecting good crop yields every year now that the new drainage canal is in operation.

"If this land is dry, nothing will beat it," he declared.

When the original drainage system was constructed, an attempt was made to carry all the water in a westerly direction to the Black River. This actually increased the drainage problem on the east side of the district, owing to failure of the drainage system to function as intended. Besides damaging cropland, the water that overflowed from the old drainage canal followed a natural outlet through the town of Lynchburg where it created a problem for the town, highway department, and railroad.

When the new drainage program was undertaken, the first step was to provide an outlet on the east side into the Lynches River through the new canal. This will give immediate relief from overflows for farm land on the east side of the district, will provide a diversion for water that has been flowing through the town of Lynchburg during periods of heavy rainfall, and will reduce the volume of water that the old drainage system had to handle through the single outlet into the Black River.

The new program will not bring any considerable amount of new land into cultivation, with the exception of cut-over woodland that may be cleared for crop production after adequate drainage has been provided. Nevertheless, it is expected greatly to increase production on existing cropland by eliminating the hazard of crop failure due to inadequate drainage. On much of this land in the past, a crop has been produced on the average only once in about every 3 years, according to District Conservationist Thompson.

Combining a sound drainage program with the development of complete conservation plans for individual farms, including assistance to farmers in planning their farm drainage, is a new approach to this problem in the Southeast. With the widespread development of farmer-organized and farmer-operated soil conservation districts, it provides a basis for sound utilization of extensive areas of land that are vitally important not only to increased production needed in the war effort, but to a longtime conservation program.

Said the little raindrops to the little rill,
"Mind if we join you and race down the hill?"
Quick came the answer: "It's O. K. by me,
"I'm headed for the ocean and would like company.
"We'll wash out a channel, amazing to see,
"And when the rains are over, what a gully there will be!"
"Pipe down," growled the terrace, "You won't get by me!
"So you'd better join the Navy, if you want to go to sea."

—Inez P. Kishton, Magazine S. C. District.

MORE FOOD WITHOUT WASTE—MISSOURI'S GOAL

BY K. G. HARMAN[1]

Missouri's program of increased production is based on soil conservation, to help guarantee sufficient food not only for winning the war but also for writing and keeping the peace.

Millions of people in Europe and Asia will be clamoring for food when this war has ended. We want to be in a position to satisfy their needs, both for their sakes and for the sake of our own national well-being in the future. Thus America must be in a position to produce enormous quantities of food for several years—probably 10 or more. The study of production goals should be approached from a long-time viewpoint, with consideration of all factors that will give maximum sustained yields over that period. A thorough inventory of the soil resources of a State should be taken as a basis for setting up goals. The goals should then be adjusted so that high production may be safely maintained for this and a longer period of time.

Missouri has launched a program to obtain maximum food production without serious soil waste. Key crops in this program are small grains and legumes. Other erosion-control practices tied in with this cropping program are contour farming, terracing, and improvement of pastures and meadows.

Experiences of more than 4,000 farmers—in 42 Missouri counties—who cooperated with the Soil Conservation Service in applying complete soil-saving plans have proved the effectiveness of conservation farming to increase food crops. Although they have decreased their acreages of cultivated crops an average of 30 percent, their total food production is up, their cost of production is down, and their soil resources are being conserved. These 4,000 farmers are representative of the State's agriculture, including both owners and tenants on good, medium, and poor land. Their results should be a logical guide to goal planning and sustained production.

[1] Acting State Conservationist, Soil Conservation Service, Columbia, Mo.

The accompanying table shows the increases in animal-unit production on four farms as a result of conservation methods. These farms have varied soil types and are at widely separated points in the State. They also vary considerably in size, and are used primarily for livestock farming. The increase in animal units, ranging from 25 to 55 percent on the four farms, has resulted almost entirely from soil improvement and conservation practices on small grain, meadow, and pasture.

Missouri farmers could greatly increase the total production of cultivated crops by plowing up meadow and pasture land, but the disastrous effect of this method was proved conclusively in World War I. Furthermore, an increase in the acreage of cultivated crops might actually decrease the output of dairy and meat products which are even more essential now than corn and wheat. Other disadvantages would be the need for more farm labor, and an eventual decline in food production capacity.

The advantages of the small grain-grass-legume type of farming, listed below, are readily apparent and are fully recognized in the Missouri plan.

1. Soil resources will be preserved and soil fertility restored.
2. Our victory can be backed up with food for peace.
3. Dairy and meat products will be increased.
4. Quality of food will be better.
5. Cost of production will be lower.
6. Less labor is required.
7. Dangers of livestock disease will be lessened.

The crops department of the Missouri College of Agriculture has emphasized the value of small grain-lespedeza farming from the standpoint of beef, mutton, and dairy production. While it does not offer as many possibilities in pork and poultry production as in the others, yet the grain can be used

Changes in crop acreages and increase in animal units on four Missouri farms having complete soil conservation programs

Farm owner	Year	Corn		Small grains			Misc. hay		Alfalfa		Pasture		
				Oats		Wheat					Unimproved	Improved	Animal units
		Acres	Bu. per acre	Acres	Bu. per acre	Bu. per acre	Acres	Tons per acre	Acres	Tons per acre	Acres	Acres	
Eugene Glover,[1] Fulton, Mo.	1934	10	25	10	27	------	20	1	------	------	27	0	18
		[2] 20	25										
	1941	12	50	------	------	------	------	------	11	3	------	45	28
Sam Caldwell, Washington, Mo.	1936	16	45	22	20	------	7	1	------	------	20	------	12
	1941	12	60	18	30	------	3	1½	14	3	------	22	16
G. W. and Lambert Seyb, Ashton, Mo.	1936	5	20	25	22	12	98	1	------	------	149	------	29.1
	1941	10	30	18	40	25+	70	1½	------	------	127	37	40.7
Henry Brooks, Eagleville, Mo.	1932	50	35	25	25	------	45	¾	------	------	70	------	30
	1941	26	43	19	37	------	34	1½	9	3	------	104.2	39½

[1] Mr. Glover grows no grain crops except as a meadow becomes poor or a pasture needs renovating. He follows a pasture-meadow system. [2] Rented land.

for poultry. If barley is grown, the grain can be used for hogs, and lespedeza furnishes excellent hog pasture. It is doubtful if 50 percent of the production capacity of farms of this type in Missouri has been used to date.

This system is particularly adapted to soils of medium to low fertility, but it is also adapted somewhat to land of higher fertility. Increased production of small grain and lespedeza also can be obtained by soil treatment.

In addition to quantity of food produced, the quality is a vital factor. The Soils Department of the Missouri College of Agriculture has proof of the increased quality of feed produced from soils that have been given the proper soil treatments. It has been found that even legume hay grown on soils of low fertility will not give efficient gains and in many instances will not even sustain the animal, while legume hay produced on similar soils having proper soil treatments does give economical gains.

It is hardly necessary to mention the benefits of increased production through maintenance of soil fertility. It would seem then that, if we recognize the benefits of increased quality, to which may be added the increase of quantity by proper soil treatments, every possible effort should be made in our goal planning to make full use of soil-improvement methods. Among the first goals that should be set are (1) to meet the fertility needs of our soils and (2) to establish good land use practices.

The Missouri College of Agriculture through its extension service has inaugurated a balanced farming project that encourages good farm management. Farmers cooperating in this program are coming together in groups and planning the use of their farms. Like the cooperators of the Soil Conservation Service, they are studying the factors involved in order to develop a balanced farm plan. They are using as a guide a soil-fertility standard that has been worked out by members of the Extension staff. Progress of this planning program indicates that farmers themselves believe that the most productive, economical, and profitable system for their farms is one that increases use of soil treatments, rotations, legumes and grasses, rather than one that increases cultivated crop acreages.

INTRODUCCIÓN A LA GEOGRAFÍA DE CUBA. By Salvador Massip and Sarah E. Ysalgue de Massip. Habana, Cuba, 1942.

In proportion to its size, no Latin American Republic is more vital than Cuba to the welfare of our own country. It spans the entrance to the Gulf of Mexico, and serves as a bridge between the predominantly Anglo-Saxon culture of North America and the Spanish culture to the south. The United States is not only Cuba's best customer for agricultural products but also the nation from whom Cuba purchases the greater part of its own imports. Because of this intimate relationship, we in the United States have a particular interest in Cuban agriculture and in the land that supports it. Basically this interest is geographic. It is geographic position, land forms, rock structure and overlying soil, climate, drainage, and native vegetation that determine our agricultural imports from Cuba. For this reason we in the United States welcome the publication of "Introducción a la Geografía de Cuba" by Doctors Salvador and Sarah E. Ysalgue de Massip.

In the past little has been written on the geography of Cuba, and most of that is widely scattered among various foreign scientific journals, not readily available to Cuban students. The Massips, therefore, have performed a particularly valuable service by assembling within a single volume, information from a wide range of English, German, French, and Cuban sources and integrating it into a unified whole through their own intimate knowledge of the island republic.

The book explains simply and effectively the sequence of geologic changes that created the landscape of today with its wide variations of agricultural potentialities and, consequently, erosion hazards. The presence of red soil underlain by limestones coincides the distribution of the most productive sugar lands. Where the land is underlain by soluble limestone, surface drainage may be lacking and the resulting soil-erosion hazards are those characteristic of karst lands in any other part of the world. Accelerated surface erosion, by contrast, prevails where soils are underlain by less permeable rocks, such as the igneous rocks exposed at the center of an anticlinal fold by geologic erosion of the overlying sedimentary strata.

After a general discussion of the evolution of the geomorphology of Cuba, the Massips proceed with detailed descriptions of the four major physiographic provinces of Cuba—Occidente, Las Villas, Camaguey, and Oriente. On the subject of soils, they follow H. H. Bennett closely and the maps used to show the distribution of soil types are reproduced from Dr. Bennett's article in the Geographical Review for January 1928.

A particularly noteworthy feature of the book is the generous use of photographs, maps, and diagrams, which are in reality an integral part of the text rather than mere illustrations. The photographs, carefully selected to show types of land form and land utilization, are accompanied by long legends that emphasize and reduce to the specific, points developed in the text. The same is true of the numerous maps and diagrams. Since standard geologic symbols, common to all languages, are used throughout, even a person with but a slight knowledge of Spanish could learn much about Cuba from a careful study of the diagrams. The maps and diagrams were prepared by Dr. Erwin Raisz of the School of Geographical Exploration of Harvard University and are, on a whole, very effective. Occasionally, however, the illustrator has attempted to show too much in a single drawing or used too small lettering, thus sacrificing legibility. Unfortunately, the one large map showing the entire island of Cuba is woefully lacking in place names. This might offer little difficulty to a native Cuban but it is a serious limitation in this country, where few offices or even libraries possess adequate maps of Cuba.—Reviewed by Lois Olson.

FARM PLANS—TOOLS FOR PRODUCTION

By THOMAS L. GASTON[1]

FROM TIME immemorial farmers have had farm plans; in fact, every farmer has a plan—for a day, a week, a month, a year, or for a longer period. Perhaps many farmers do not realize this. The plan may or may not be in writing—probably in most instances it is not—and it may consist of any combination of the myriad considerations essential to the operation of the farm or ranch. The methods of growing and harvesting a crop, or of handling a particular number of livestock may be the problems considered. Or a problem of soil management or fertilization may be the uppermost thought. Practices of tillage, marketing, etc., or improvement structures—dams, ditches, terraces or buildings—may be included. The plan may be in the nature of an inventory and income statement useful in guiding future adjustments. At least parts of the plan are quite flexible, as for example the seeding of a particular crop within certain dates if it rains, or perhaps, if it does not rain.

The general purpose of the farm plan is to serve as a guide for producing needed or useful crops or livestock, or livestock products, either or both in greater quantities or at less cost—during the ensuing season or for a longer period. In many instances the general purpose is wholly or partly accomplished, but frequently it is not. If the effect of uncontrollable factors, such as weather, insects, diseases, and market fluctuations is overlooked, the usefulness of the plans is perhaps proportioned to the soundness of the thinking and judgments entering into their formulation. Whether the result for a particular period is production of greater quantities or lessened cost, the effect has been "official," insofar as thoroughness of thinking and soundness of judgment are furthered. In the field of agriculture, each kind of plan is important—the written and the unwritten, the simple and the complex, the specialized and the all-inclusive. For particular purposes, one type is more effective than the other, and in other circumstances, still another type.

During the last 25 to 30 years, with increased emphasis on public assistance to agriculture, farmers generally have given progressively greater consideration to their farm plans. This emphasis has been especially marked during the last 10 years. Some public agricultural programs have been geared with a single type of farm plan as a foundation. Two or more types of farm plans have been the foundation of other programs, and various kinds of farm plans have been a partial foundation for still other programs. Some of the written plans are characterized by such terms as farm and home management record, farm and home management guidance plan, farm budget, soils management plan, rotation plan, water disposal plan, farm drainage plan, farm poultry plan, farm dairy plan, farm beef plan, farm irrigation plan, farm contour plan, farm terrace plan, ranch management plan, farm labor plan, farm conservation plan.

Generally speaking, the farm plan that is wholly or partially written, is more fruitful than the unwritten—and this statement is made with no intention of deprecating either the place or effectiveness of the unwritten. However, the expression in writing or diagrams of the thinking and judgments does lead toward a fuller scope of the circumstances and a more concrete visualization of contemplated fuller action. Furthermore, if written, the plan may be referred to from time to time as long as it is kept. More particularly is the written as compared with the unwritten plan significant if the plan is a foundation for a public assistance program. With the professional worker, who deals with generalizations and abstractions to a greater degree than the farmer, the writing facilitates visualization of the practical circumstances involved. If the worker helps the farmer develop and write the plan, the writing tends to help him to be practicable and thorough. In fact, the changing of personnel connected with a public assistance program—whether local, State, or Federal—almost necessitates that the type or types of plans upon which the program is based be written.

The farm plans which have soil conservation—continued production—as a basic purpose, in addition to either quantity production or lessened cost, may be classified in three groups as follows:

Specialized plan.—The scope includes only a single crop such as grass mixture for a particular slope; or a single practice—as contour cultivation, trashy tillage, or proper stocking of range land; or a single structure, such as terraces or small dam for catching silt, retarding run-off, or water spreading.

Partial plan.—This plan includes either a portion of what is practicable and feasible on the farm in the light of current knowledge, or only a part of the farm.

Complete plan.—The complete plan includes all that is practicable and feasible, in the light of current knowledge, on the entire farm as a unit.

[1] Assistant Chief of Operations, Soil Conservation Service, Washington, D. C.

Each of these types of plan is important to some farmers. Each is important in one or more public assistance programs. Each fills an important and effective niche in the farmers' and the Nation's objective to attain the needed production, present and future, of agricultural products.

The *complete* type of plan, written or unwritten, is commonly considered as an ideal approach for meeting the soil conservation problems on an individual farm or ranch—or for that matter, on a group of farms or ranches. Effective rotations are more easily adopted. Crops and livestock may easily be kept in optimum balance respecting pasture, hay, and feed needed. Terraces, contour lines, diversion ditches, and the like may cross two or more fields—or farms—with the greatest amount of effectiveness, least construction input, or minimum number of outlets. The most convenient field or wood lot lay-out may be attained. Rotations meeting soil or range management problems for maximum production can be more easily followed and at the same time balance can be maintained between cash crops, pasture, and feed.

Farms or ranches upon which *complete* plans are applied may serve as invaluable guides, or "targets of effectiveness," at which *partial* or *specialized* plans—whether written or unwritten—may be aimed. Naturally, the area where this purpose is served includes chiefly those farms within the locality having similar problems.

Each type of farm plan, and whether written or unwritten, has an important role in present and sustained production. It is to be hoped that as experiences are gained in public assistance programs the kinds of farm plans can be reduced and simplified, and this without losing sight at any time of the main objective of increasing production, lessening production cost, or otherwise bettering the welfare of farm families.

WAR ON WEEDS

BY A. T. SEMPLE

IN SELECTING and establishing good grazing for our cattle and other stock, we look for the most palatable plants that will produce abundantly throughout the growing season in spite of changing weather conditions and steady pressure by grazing animals. To whatever extent weeds are allowed to grow, just that far do we fall short of our objective to have a pasture produce what it ought to produce. Weeds rob the forage plants of plant food and moisture. The taller weeds shade out some of our most desirable forage plants, such as white clover and Bermuda grass.

Weeds, being generally unpalatable, are avoided by the stock, so that much of the forage that may be growing with the weeds is wasted. On the other hand, in spots where the weeds do not interfere with grazing, the forage plants are likely to be so badly overgrazed that they fail to produce seed or maintain a vigorous growth. Thus, weeds promote patchy grazing with the result that production is reduced and forage is wasted. Meanwhile, the weeds flourish and produce seeds by the millions.

According to actual count, bitterweed produces as many as 3,000 seeds per plant; mayweed, 2,000; bull thistle, 10,000; daisy fleabane, 22,000; and curled leaf dock 10,000 seeds. Is it any wonder that weeds "take" a pasture?

In Mississippi, one part of a pasture was mowed and another part was unmowed for three successive years. Clippings were made on both parts at frequent intervals to duplicate grazing as nearly as possible. Some areas were protected from grazing for short periods. Differences in yield between these protected plots and similar grazed plots clipped at the same time gave a measure of what plants and how much the cattle actually had eaten.

In the unmowed part, 2½ times as much feed was left uneaten as in the mowed part. In other words, on the mowed part of the pasture, the cattle ate 80 percent of the plant growth. On the unmowed part, they ate only 50 percent of the growth. However, the total production of grass was approximately the same in both plots.

Since mowing a pasture increases the feed supply by 50 percent, what farm operation pays any better? With weedy pastures so prevalent, we must think of mowing as an important contribution to our war goals for greater meat and milk production. Pastures and range supply half the feed for all of our livestock. Even a 25-percent increase in the feed supplied by grazing would mean a net increase of about 12½ percent in the total quantity of meat and milk and other livestock products.

There is, however, even more advantage to be gained from mowing pastures, for this practice also affects the quality of the herbage to be grazed. On the mowed pastures in Mississippi, the herbage contained an average of nearly 12 percent protein (11.76) throughout the season. On the unmowed pasture, the herbage averaged a little less than 7 percent (6.92) protein. The difference in protein resulting from mowing was 172 pounds. This is equivalent to that contained in 422 pounds of 41-per-

cent cottonseed meal. At $40 per ton, it would cost $8.44 to make up the deficiency of protein in each acre of unmowed pasture. It looks as if mowing pastures may be one of the most profitable things a farmer can do. Is it too good to be true? Ask the farmer who mows regularly. B. C. Balch of Conway County, Ark., who has been building pastures for 33 years on worn-out cotton land, mows regularly twice a year and has some of the best pastures in the United States.

Chemical analyses of grasses at various stages of maturity have shown the value of clipping in increasing the nutritive value of the grass. Dallis grass clipped in the seeding stage analyzed 6.9 percent protein; 2 weeks later new growth from the same area contained 18.7 percent of protein. Bermuda clipped in the seeding stage contained 7.1 percent protein. Such grass is very unpalatable. Two weeks later, the new growth contained 19.1 percent of protein. Such feed is highly palatable and nutritious.

At least a word or two of caution is necessary as in all farm operations. To be effective in weed control, the mowing must be timed to catch the most objectionable weeds—when they are nearly mature, but before the seeds are well formed. If the mowing is done when the weeds are beginning to bloom—the time at which food reserves in the plant roots are near the lowest point—the whole plant is most likely to be killed. In the case of some plants such as bitterweed and mayweed, mowing should be done when blossom forming starts, rather than when flowering begins, because at that stage, viable seeds have been formed.

Many farmers do not want to destroy nests of pheasants, bobwhite, and other useful birds that frequently raise their broods in the grassy cover of well-managed pastures. If the first mowing of the season is delayed until the young birds have hatched—and in most places this occurs before the weeds have seeded—the pasture can produce better grass and game birds too. Some farmers who want to mow early use a flushing bar which flushes the setting bird from the nest and warns the driver to pick up the mower blade in time to skip the clutch of eggs.

Many perennial weeds must be mowed for 2 or 3 years to be certain that the roots are killed. Continuous cutting of the top growth exhausts the strength of the roots until they die.

More details on the experiment in mowing weeds and much additional information on making pastures more productive is to be found in Mississippi Experiment Station Bulletin 356, "Pastures in Mississippi," by H. W. Bennett.

DUTCH IMMIGRANT

(Continued from page 221)

idly recovering his health in New Mexico's pleasant climate and nothing now seems too difficult for him.

Again hearkening back to his days in Holland, he drew a striking parallel.

"Soil erosion in this country," he said, "is like the ever-present danger of the sea in Holland. Both dangers may be disregarded until it's too late.

"Sometimes, back in Holland, farmers postponed necessary repairs to their dikes. For years, everything seemed all right, but suddenly the dike would break, flooding thousands of acres with salt water, drowning people and cattle, and destroying crops and houses.

"Some American farmers seem to be equally shortsighted. They overlook—or don't want to see—the gradual wastage of soil. They may raise fairly good crops for a long time, but inevitably there comes a day of reckoning—and the land may be ruined.

"'To have and to hold.' That's a saying with deeper meaning than certain careless and irresponsible landowners are willing to understand."

So saying, Henry Folmer turned and looked speculatively at his fields and his pasture land. The determined set of his jaw, the meditative gleam in his eye—these spoke eloquently of the pride and the ambition of an immigrant who had found freedom in a new land.

PASTURES STOP EARLY TAKE-OUT

IN 1935, Dr. T. B. Hutcheson, of Virginia Polytechnic Institute, made the following statement regarding some of the best pasture sections in the United States that were famous around 1900 for production of high grade beef for export: "The trouble in southwest Virginia is that pastures don't come out until 2 weeks later than they used to; they 'take out' 2 weeks earlier in the fall; and when they are growing they don't support the cattle they used to." At that time only 5 percent of the pasture had received applications of phosphate.

A recent survey by VPI shows that since 1935 pastures on over 70 percent of the farms in nine southwest Virginia counties have been phosphated. Pastures in the area are now greener; they last longer and carry more cattle.

The report of J. H. Box, who operates a TVA test-demonstration farm in Smyth County, shows what an individual farmer can do. In 1934, he was cultivating 88 acres. In 1935 he began following a

regular rotation of crops and reduced his cultivation to 39 acres. By building up fertility, principally with lime, phosphate and legumes, Mr. Box increased his crop yields by 75 percent. With phosphate and good management, he restored his pastures and doubled the number of cattle the farm would support. The increased farm income enabled his married son to return to the farm. They have modernized two houses, built a new barn, and repaired the old one.

On a group of 46 such farms, in southwest Virginia, average receipts (gross income) increased steadily from $2,989 in 1934 to $3,574 in 1939. Since these figures are adjusted for changes in prices, they represent a 20-percent increase in production. The products are chiefly beef, dairy products, sheep, hogs, and poultry.—A. T. Semple. (The information is based on a speech by David E. Lilienthal, Chairman, Tennessee Valley Authority, at Abingdon, Va., April 11, 1942.)

GIVE GOOD GRASSES A CHANCE TO GROW

On a Brown County, Tex., farm of 300 acres, Amos Porter has doubled the carrying capacity of his pasture by good management. When he began operating this farm 3 years ago, the pasture was grown up to brush and coarse grasses. He brought the brush under control by putting on 5 goats for each cow and grazed the coarse grasses heavily in the spring while they were palatable. Then he moved the cattle to oat stubble fields containing Johnson grass for summer grazing. This gave the desirable grasses an opportunity to reseed and become better established.

GREEN FEED IN STALK FIELDS

Joe Kohl's cows, near New England, S. Dak., graze contour buffer strips of crested wheat which are used in the contour cultivation of his corn. He says his "cows walk right through the standing corn fodder in the fall to get at the green crested wheat grass . . . and when they feed on crested wheat grass, milk production rises appreciably." This use of grass along with contour cultivation on the steeper land also increases grain yields, and provides good crops of hay and seed. Mr. Kohl is convinced that it makes his machinery last longer with fewer break-downs and repairs. With more water going into the soil for crop production, there is less rilling and gullying. Hence, the ground is smooth, there is less jolting, tractors require less fuel, and horses can cover more ground in a day.

AFRICAN ASSIGNMENT

THE LINE in the song from the first World War that went "though the boys are far away they dream of home" seems to hold good for World War 2. If they used to be Soil Conservation Service workers, they are still thinking in soil conservation terms—so it appears from a letter from one of our former men now in North Africa.

First Lt. John N. Davis has written to his old "boss" of the Spartanburg, S. C., project days, who is now chief of the Regional Records and Reports Division at Spartanburg, relating, among other things, that he has run across a soil conservation project in North Africa.

"*Defense et Restouration du Sols* was written in huge letters across the hillside," Lieutenant Davis wrote, "and although I was quite a distance away the hillside had the appearance of having been benched for the purpose of conserving water. As you know, water is a scarce article over here. I'm very proficient as a quart bather, you should see me!

"If I only had one of the 35 mm. cameras and some film, I could really take some pictures that would be of invaluable assistance when I get back to the job," he continues. "I have seen slopes, in cultivation, so steep that it is impossible to stand on them. I've seen erosion rampant and unchecked. I've seen the most modern farms and farming methods, including machinery, and 20 miles away I've seen the most primitive sort of farming and farming tools."

The letter from Lieutenant Davis acknowledges receipt on Christmas Eve of a news letter which Mr. Jeffords mimeographs as an extracurricula activity and sends to all former SCS men from South Carolina and the regional office in the armed services. In addition to being editor of the news letter, Mr. Jeffords is also a pipe collector and recently he has been getting pipes from SCS men in all parts of the world.

"I'll make an effort to get you a North African pipe when I can," Lieutenant Davis writes. "At present, none seems to be available, but I'm on the lookout."

Prior to joining the armed forces, Lieutenant Davis was work unit conservationist in the Lower Saluda Soil Conservation District in South Carolina.—B. K.

Sloan Lightcap, Marion Center, Pa., estimates a one-third saving in power and labor with strip farming and says there is a considerable saving in wear and tear on machinery. He can use two horses and handle a grain binder on the strips as easily as with three horses previously.

BOOK REVIEWS AND ABSTRACTS

by Phoebe O'Neall Faris

STRIP CROPPING FOR WAR PRODUCTION. By Harold E. Tower and Harry H. Gardner, *Farmers' Bulletin No. 1919.* January 1943.

Farmers and field men of the Soil Conservation Service and other agricultural agencies have been working diligently for several years to perfect strip-cropping methods for different regions of our country. This publication describes the four general types of strip cropping now being widely used especially on the two and a quarter million farms within soil conservation districts. Mr. Tower and Mr. Gardner have given the subject thorough treatment. The result is that we now have available a practical and complete treatment of the strip system of cropping, including field arrangement, rotations, contour cultivation, soil fertility management, grassed waterways and field borders.

The strip-cropping system of farming is especially important in preventing water and wind erosion and conserving soil moisture, but it also has proved very effective in increasing crop yields. The latter half of the bulletin gives recommendations for adapting strip cropping to the several regions of the United States—the Northeastern and North Central States, the Southwestern and West Gulf region, the Great Plains, and the far West.

MORE FOOD THROUGH CONSERVATION FARMING. By Arthur T. Semple, United States Department of Agriculture *Farmers' Bulletin 1909.* September 1942.

There can be no doubt whatever now that conservation farming guarantees greater yield for war emergency needs and continuing balanced production after the emergency is over. Bulletins such as this one, written especially for farmers, are important contributions to the long pull ahead in meeting demands for the food, fiber, and oil crops that we must produce on our own soils and in great quantities for some years to come. The farmer can use this publication as he would use any other tool because it is packed full of practical helps that will be of value throughout planting, growing, and harvesting seasons and in planning for another year.

Since this is a wartime bulletin the author has held closely to the wartime objective—to produce on the farms of our country maximum amounts of the crops needed to help win the war, and to do this without injuring the land. For this reason, each phase of farming is discussed briefly and simply to point out conservation methods most easily and quickly applied—things to do to prevent waste of power, fuel, labor, machinery, water and feed, and above all, the land.

How and where to increase crops; what to do with sloping land; how to make wet land more productive; the part of woodland in the war; cattle numbers as related to pasture, range and feed; cover crops to offset nitrogen shortages; economical use of fertilizers, manure and stalks and stubble—these are but a few of the emergency problems handled in the 54-page bulletin. Specific wartime crops are treated in more detail than others not needed urgently during the present crisis; but it might be said that Mr. Semple's bulletin is most valuable for its great number and variety of "tip-offs" to the farmers of the country, in every climatic region, on things to do on their own farms to attain better yields through greater efficiency in handling crops and the land. More than 50 excellent photographs, taken on probably as many farms in different parts of the country, are included to point out methods and reasons for using them to increase yields.

"More Food Through Conservation Farming" is a cooperative work: different divisions of the Soil Conservation Service supplied most of the information, but important parts of the text were also supplied by Bureau of Plant Industry, Agricultural Adjustment, Extension Service, Animal Industry, and Animal Husbandry.

STUBBLE-MULCH FARMING FOR SOIL DEFENSE. By L. S. Carter, *Farmers' Bulletin No. 1917.* December 1942.

Because, this war, we want to go warily to avoid the disastrous aftermaths of the plow-up orgy of last war, we are determined to use farming practices that will give some assurance of soil security. Mulching is one of these practices. This bulletin is not merely a reminder, or a discussion of stubble-mulching; it is compact and brief, but it tells the how and the why and the where of this simple but effective method that can be fitted so easily into the farming plan to utilize soil and moisture to best advantage and to keep down weeds and crop pests.

Specific directions are given to point out the materials to be used for mulching and the important steps in the operation on the land; how to plan rotations with mulching in mind; and ways of adjusting or modifying almost any kind of implement for best results in cultivating straw, stalk or stubble mulched fields. About 30 photographs are included so that the farmer may actually see what is meant by efficient use of crop residues on his farm and what he can accomplish by shifting implement parts to suit the job at hand.

STRATIFIED FLOW IN RESERVOIRS AND ITS USE IN PREVENTION OF SILTING. By Hugh Stevens Bell, *Miscellaneous Publication No. 491.* September 1942.

The Chief of our Service has written a Foreword to this publication to point out the importance of keeping the reservoirs of the country in good condition at all times and particularly during the period of wartime production so that water may be conserved and utilized in growing the food crops essential to the welfare of the Nation. The text of the bulletin constitutes a description of the movements of sediments and debris in lakes and reservoirs according to natural laws as discovered in studies made by the Sedimentation Division of the Soil Conservation Service in cooperation with the staff of the United States Bureau of Reclamation at Boulder City, Nev.

The object of the studies was to discover ways of utilizing the power, the direction and the velocities of density-current flow, in reservoir construction and operation, to minimize loss of capacity and to maximize the useful life of these costly structures. By means of properly placed outlets it is thought that a large percentage of the sediment that finds its way into water-impounding lakes and reservoirs can be carried beyond dams through use of stratified flow.

Between 40 and 50 unusually fine photographs are shown to point out the action of turbid underflow and muddy water discharges. The author has made this relatively new subject interesting by using an easy, readable style of writing and everyday examples—the tumbler of iced coffee, the "giant griddle upon which batter has been freshly poured," the dust cloud and the fog bank—to illustrate stratified movements under water and on top of water in impounding lakes and reservoirs. The glass-walled laboratory reservoir, which reveals the most hidden secrets of density currents, was used and is still being used in studies of stratified flow, and some of the finest of the photographs taken through the glass walls are included in this publication. These photographs are sufficient proof of the importance of intensive explorations of this kind in the interests of conservation and utilization of rainfall.

DAY LENGTH AND CROP YIELDS. By M. W. Parker and H. A. Borthwick. United States Department of Agriculture *Miscellaneous Publication No. 507.* September 1942.

This is a brief report of recent findings by Bureau of Plant Industry scientists on the effect of length of daylight periods upon crop plants. Different varieties of such important wartime crops as soybeans, hemp and sugar beets were shown to have wide-range growth reactions to day lengths.

Choice of variety according to climatic conditions with special reference to length of light and dark periods was found to be an important factor in soybeans. This urgently needed wartime crop is being grown now in both the Northern and Southern States, in some instances solely for seed for use in making oil, food products and plastics, and in others for forage. It is thought that increasing acreages of soybeans can be grown successfully and economically over wider areas by careful selection of variety with regard to intended use of the crop and the daylight needs of the plant itself.

Tests with sugar beets have been most successful, especially in selection of localities best suited to excellent yields of seed. As a result of experiments with day lengths and temperatures, we now produce in the United States sufficient sugar-beet seed for our own use; whereas only a few years ago we imported from Europe almost all the sugar-beet seed we used to produce the crop.

CLASSIFYING LAND FOR CONSERVATION FARMING. By R. D. Hockensmith and J. G. Steele, United States Department of Agriculture *Farmers' Bulletin No. 1853.*

The man who owns a farm, or works somebody else's farm, or wants to buy a farm, needs to know, first and last, what his particular piece of land is capable of doing for him. Hit-or-miss farming doesn't pay any more in the United States because, whether we like it or not, "already two-thirds of the farms and ranches have been damaged to some extent by soil erosion." It is for this reason that, for a decade now, men of the Soil Conservation Service have been surveying farm land all over the country, often farm by farm and field by field, to determine where crops can or cannot be grown successfully with safety to the soil; where soil-saving and soil-improving practices are needed; where production can be increased while at the same time the soil is improved rather than depleted; where trees are needed, or permanent grass—many other facts that when used in planning will bring about better land use, more efficient farming, more food and fiber, more farmer income, without waste of our soils. At this date, 500,000,000 acres have been surveyed—150,000,000 acres for detailed farm plans and the remainder to determine general conditions applicable to type-of-farming planning.

This bulletin is the first "popular" presentation of the land-capability survey methods used by our Soil Conservation Surveys Division, and it is to be hoped that it will have wide distribution among farmers. It tells, in "everyday" language what the soil surveyor does when he goes into the field armed with soil auger, sighting instrument, map and sketching materials. It also tells why he is in that field and what he is looking for, and how the information he is gathering will be used to the advantage of the land and the people who own it, work it, or contemplate working it in the future.

The eight land-capability classes are shown in outline form and each is explained clearly and simply. In fact, it looks as though the farmer himself, with this new bulletin as his guide, might be able to determine to some extent the degree of past erosion and the present erodibility of his land, the use to which it should be put with or without conservation practices, and its restrictions and limitations—in short, what he can expect from his land and his labor if he does or does not treat his fields according to their capabilities. It might be a good idea, upon second thought, for neighboring farmers to look at one anothers' fields—a gully on another man's land is more easily recognized as a gully!

To show how the land-classification survey information is used, the authors describe in detail a conservation plan made for an actual farm of 151 acres located in Abbeville County, S. C.

It is expected that this bulletin will prove useful immediately, since it is compiled, both text and illustrative material, to meet wartime production needs. County war boards are to be supplied with copies, and parts of the text are to be used in the training courses for visiting Latin American students now in the United States for the express purpose of studying soil conservation methods and practices.

Mrs. Zeola Owen, who has 80 acres of timber on her farm near Springfield, Tenn., was able to buy $2,000 worth of war bonds with the income she got from the sale of mature and over-mature trees from 44 acres of this woodland. At the same time she improved the stand of timber.

Mrs. Owen was the first cooperator of the cooperative farm forestry project established in the Robertson County soil conservation district.

Selective cutting included 67,000 board feet of red and black oak sold at $13 per thousand; 21,000 feet of white oak at $35 per thousand; 8,000 feet of poplar at $60 per thousand. Thirteen black walnut trees yielded gunstock material at $80 per thousand.

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Compiled by ETTA G. ROGERS, Publications Unit

Field offices should submit requests on Form SCS–37, in accordance with the instructions on the reverse side of the form. Others should address the office of issue.

SOIL CONSERVATION SERVICE

101 Examples that Soil and Water Conservation Practices Produce More Food Now. Regional Office, Soil Conservation Service, Lincoln, Nebr. mm.

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[1] From Superintendent of Documents, U. S. Government Printing Office, Washington, D. C.

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DETROIT

That looks like a grassed waterway—that gap up yonder between those two dark bands of fresh-plowed earth. Turn the picture 90 degrees clockwise, and you have a rather perfect "V" for Victory."

Levi Cuttebo, Iowa farmer, here plows out a contour strip in preparation for small grain. Strips above and below will be in corn and beans. Mr. Cuttebo knows how important are contour plowing and grassed waterways, among the many conservation measures calculated to boost crop yields.

American ingenuity and enterprise and patriotism ride up there behind the tractor wheel, helping to solve the terribly urgent problem of how to get the highest possible production in the face of almost—but not quite—insuperable difficulties.